

## CLAIMS

What is claimed is:

1. In a code division multiple access (CDMA) system that receives a plurality of data signals distinguished by codes, a method comprising:
  - (a) constructing a system response matrix using all possible codes and channel responses associated with their codes;
  - (b) based on the constructed matrix, performing N soft symbol estimates for the first N symbols of each of the possible codes;
  - (c) based on the N soft symbol estimates for the first N symbols of each of the possible codes, determining received codes; and
  - (d) extracting data from the matrix associated with the received codes.
2. The method of claim 1 wherein the step of extracting data is performed using a multi-user detector (MUD).
3. The method of claim 2 further comprising:
  - (e) passing the N soft symbol estimates to the MUD, wherein the MUD does not repeat the computation of N soft symbols of each received code.
4. The method of claim 1 further comprising:
  - (f) marking codes in the constructed matrix that have not been received by the system as being invalid; and
  - (g) marking codes in the constructed matrix that have been received by the system as being valid, wherein the invalid codes are not used for performing the processing of the data.
5. The method of claim 1 wherein the N soft symbol estimates are used for code energy measurement in blind code detection.

6. The method of claim 1 wherein the N soft symbol estimates are used for performing an end-of-DTX detection code energy measurement.

7. The method of claim 1 wherein the N soft symbol estimates are based on whitening matched filter (WMF) outputs.

8. In a wireless transmit/receive unit (WTRU) that receives a plurality of data signals distinguished by codes, a method comprising:

- (a) constructing a system response matrix using all possible codes and channel responses associated with their codes;

- (b) based on the constructed matrix, performing N soft symbol estimates for the first N symbols of each of the possible codes;

- (c) based on the N soft symbol estimates for the first N symbols of each of the possible codes, determining received codes; and

- (d) extracting data from the matrix associated with the received codes.

9. The method of claim 8 wherein the step of extracting data is performed using a multi-user detector (MUD).

10. The method of claim 9 further comprising:

- (e) passing the N soft symbol estimates to the, wherein the MUD does not repeat the computation of N soft symbols of each received code.

11. The method of claim 8 further comprising:

- (f) marking codes in the constructed matrix that have not been received by the WTRU as being invalid; and

- (g) marking codes in the constructed matrix that have been received by the WTRU as being valid, wherein the invalid codes are not used for performing the processing of the data.

12. The method of claim 8 wherein the N soft symbol estimates are used for code energy measurement in blind code detection.

13. The method of claim 8 wherein the N soft symbol estimates are used for performing an end-of-DTX detection code energy measurement.

14. The method of claim 8 wherein the N soft symbol estimates are based on whitening matched filter (WMF) outputs.

15. A wireless transmit/receive unit (WTRU) that receives a plurality of data signals distinguished by codes, the WTRU comprising:

(a) means for constructing a system response matrix using all possible codes and channel responses associated with their codes;

(b) means for performing N soft symbol estimates for the first N symbols of each of the possible codes based on the constructed matrix;

(c) means for determining received codes based on the N soft symbol estimates for the first N symbols of each of the possible codes; and

(d) means for extracting data from the matrix associated with the received codes.

16. The WTRU of claim 15 wherein the means for extracting data is a multi-user detector (MUD).

17. The WTRU of claim 16 further comprising:

(e) means for passing the N soft symbol estimates to the MUD, wherein the MUD does not repeat the computation of N soft symbols of each received code.

18. The WTRU of claim 15 further comprising:
  - (f) means for marking codes in the constructed matrix that have not been received by the WTRU as being invalid; and
  - (g) means for marking codes in the constructed matrix that have been received by the WTRU as being valid, wherein the invalid codes are not used for performing the processing of the data.
19. The WTRU of claim 15 wherein the N soft symbol estimates are used for code energy measurement in blind code detection.
20. The WTRU of claim 15 wherein the N soft symbol estimates are used for performing an end-of-DTX detection code energy measurement.
21. The WTRU of claim 15 wherein the N soft symbol estimates are based on whitening matched filter (WMF) outputs.
22. A wireless transmit/receive unit (WTRU) that receives a plurality of data signals distinguished by codes, the WTRU comprising:
  - (a) a device for constructing a system response matrix using all possible codes and channel responses associated with their codes;
  - (b) a whitening match filter (WMF) for performing N soft symbol estimates for the first N symbols of each of the possible codes based on the constructed matrix, wherein received codes are based on the N soft symbol estimates for the first N symbols of each of the possible codes; and
  - (c) a multi-user detector (MUD) for extracting data from the matrix associated with the received codes, wherein the WMF passes the N soft symbol estimates to the MUD, and wherein the MUD does not repeat the computation of N soft symbols of each received code.

23. The WTRU of claim 22 wherein codes in the constructed matrix that have not been received by the WTRU are marked as being invalid and are not used for performing the processing of the data, and codes in the constructed matrix that have been received by the WTRU are marked as being valid.

24. An integrated circuit (IC) that receives a plurality of data signals distinguished by codes, the IC comprising:

- (a) means for constructing a system response matrix using all possible codes and channel responses associated with their codes;
- (b) means for performing N soft symbol estimates for the first N symbols of each of the possible codes based on the constructed matrix;
- (c) means for determining received codes based on the N soft symbol estimates for the first N symbols of each of the possible codes; and
- (d) means for extracting data from the matrix associated with the received codes.

25. The IC of claim 24 wherein the means for extracting data is a multi-user detector (MUD).

26. The IC of claim 25 further comprising:

- (e) means for passing the N soft symbol estimates to the MUD, wherein the MUD does not repeat the computation of N soft symbols of each received code.

27. The IC of claim 24 further comprising:

- (f) means for marking codes in the constructed matrix that have not been received by the IC as being invalid; and

(g) means for marking codes in the constructed matrix that have been received by the IC as being valid, wherein the invalid codes are not used for performing the processing of the data.

28. The IC of claim 24 wherein the N soft symbol estimates are used for code energy measurement in blind code detection.

29. The IC of claim 24 wherein the N soft symbol estimates are used for performing an end-of-DTX detection code energy measurement.

30. The IC of claim 24 wherein the N soft symbol estimates are based on whitening matched filter (WMF) outputs.

31. An integrated circuit (IC) that receives a plurality of data signals distinguished by codes, the IC comprising:

(a) a device for constructing a system response matrix using all possible codes and channel responses associated with their codes;

(b) a whitening match filter (WMF) for performing N soft symbol estimates for the first N symbols of each of the possible codes based on the constructed matrix, wherein received codes are based on the N soft symbol estimates for the first N symbols of each of the possible codes; and

(c) a multi-user detector (MUD) for extracting data from the matrix associated with the received codes, wherein the WMF passes the N soft symbol estimates to the MUD, and wherein the MUD does not repeat the computation of N soft symbols of each received code.

32. The IC of claim 31 wherein codes in the constructed matrix that have not been received by the IC are marked as being invalid and are not used for performing

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the processing of the data, and codes in the constructed matrix that have been received by the IC are marked as being valid.